## AMENDMENTS TO THE CLAIMS

1. (Original) A pragmatic trellis code modulation TCM decoder, comprising:

a demodulator for receiving a modulated signal and computing coordination values of symbols of the modulated signal on an I-axis and Q-axis in a constellation;

a coset mapper for generating 3-bit soft decision data based on the computed coordinate values;

a viterbi decoder for receiving 3-bit soft decision data and generating 1-bit data as a coded data by decoding the 3-bit soft decision data;

a re-encoder for receiving the 1-bit data from the viterbi decoder and obtaining un-coded information in order to compute an un-coded data;

a sector phase quantizer for obtaining I channel and Q channel information based on the coordination values from the demodulator in order to obtain un-coded data;

a time delayer for delaying output of the sector phase quantizer until the re-encoder outputs the un-coded information; and

a non-coded code decoder for computing the un-coded data by decoding the output of the sector phase quantizer based on the un-coded information from the re-encoder and the I channel and Q channel information from the sector phase quantizer.

2. (Currently Amended) The pragmatic trellis code modulation TCM decoder as recited to claim 1, wherein the coset mapper provides the 3-bit soft decision by using an equation as $x'=\cos[2(\phi - \Phi)]$, $y'=\sin[2(\phi - \Phi)]$ based on a phase difference between a basis phase, $\Phi$, and $\phi$, wherein $\phi$ is computed based on a x, coordinate of I axis and a y, coordinate of Q axis in a constellation of the received signal.

3. (Currently Amended) The pragmatic trellis code modulation TCM decoder as recited in claim ~~1~~2, wherein the basis phase is $\frac{5\pi}{8}$.

4. (Currently Amended) The pragmatic trellis code modulation TCM decoder as recited in claim ~~1~~2, wherein the basis phase is $\frac{\pi}{2}$.

5. (Currently Amended) A decoding method for a pragmatic trellis code modulation TCM decoder, comprising the steps of:

a) receiving a modulated signal and computing coordination values of symbols of the modulated signal on an I-axis and Q-axis in a constellation;

b) generating 3-bit soft decision data based on ~~the~~ computed coordinate values x' and y' by using equation $x'=\cos[2(\varnothing - \Phi)]$, $y'=\sin[2(\varnothing - \Phi)]$ based on a phase difference between a basis phase, $\Phi$, and $\varnothing$, wherein $\varnothing$ is computed based on a x, coordinate of I axis and a y, coordinate of Q axis in a constellation of the received signal;

c) receiving the 3-bit soft decision data and generating 1-bit data as a coded data by decoding the 3-bit soft decision data;

d) receiving the 1-bit data and obtaining un-coded information in order to compute an un-coded data;

e) obtaining I channel and Q channel information based on the coordination values from the demodulator in order to obtain un-coded data;

f) delaying an output of ~~the~~ a sector phase quantizer until step d) outputs the un-coded information; and

g) computing the un-coded data by decoding the output of the sector phase quantizer based on the un-coded information from ~~the~~ a re-encoder and the I channel and Q channel information from the sector phase quantizer.

6. (Cancelled)

7. (Currently Amended) The method as recited in claim ~~6~~5, wherein the basis phase is $\frac{5\pi}{8}$.

8. (Currently Amended) The method as recited in claim ~~6~~5, wherein the basis phase is $\frac{\pi}{2}$.

9. (Currently Amended) A computer readable ~~recoding~~ medium storing a program for executing a method for a pragmatic trellis code modulation TCM decoder, the method comprising the steps of:

a) receiving a modulated signal and computing coordination values of symbols of the modulated signal on an I-axis and Q-axis in a constellation;

b) generating 3-bit soft decision data based on ~~the~~ computed coordinate values x' and y' by using equation $x'=\cos[2(\text{ø} - \Phi)]$, $y'=\sin[2(\text{ø} - \Phi)]$ based on a phase difference between a basis phase, $\Phi$, and ø, wherein ø is computed based on a x, coordinate of I axis and a y, coordinate of Q axis in a constellation of the received signal;

c) receiving the 3-bit soft decision data and generating 1-bit data as a coded data by decoding the 3-bit soft decision data;

d) receiving the 1-bit data and obtaining un-coded information in order to compute an un-coded data;

e) obtaining I channel and Q channel information based on the coordination values from the demodulator in order to obtain un-coded data;

f) delaying an output of ~~the~~ a sector phase quantizer until step d) outputs the un-coded information; and

g) computing the un-coded data by decoding the output of the sector phase quantizer based on the un-coded information from ~~the~~ a re-encoder and the I channel and Q channel information from the sector phase quantizer.